GEOSCIENCE GROUP, INC.
INVESTIGATIVE PROCEDURES
Building 42 Additions & Renovations
Geoscience Project No. CH09.0088.GE

FIELD

Soil Test Borings: Eight (8) soil test borings (B-1 through B-8) were drilled at the approximate locations shown on the attached Test Location Diagram, Drawing No. CH09.0088.GE-1. Soil sampling and penetration testing were performed in accordance with ASTM D 1586-84.

The borings were advanced with hollow-stem, continuous-flight augers and, at standard intervals, soil samples were obtained with a standard 1.4-inch (3.6cm) I.D., 2-inch (5.1cm) O.D., split-tube sampler. The sampler was first seated 6 inches (15.2cm) to penetrate any loose cuttings, then driven an additional 12 inches (30.5cm) with blows of a 140 pound (63.5kg) hammer falling 30 inches (76.2cm). The number of hammer blows required to drive the sampler the final 12 inches (30.5cm) was recorded and is designated the "Standard Penetration Resistance" (N-Value). The Standard Penetration Resistance, when properly evaluated, is an index to soil strength, density and ability to support foundations.

Representative portions of each soil sample were placed in glass jars and taken to our laboratory. The samples were then examined by an engineer to verify the driller's field classifications. Test Boring Records are attached indicating the soil descriptions and Standard Penetration Resistances.

LABORATORY

Moisture Content: The moisture content is the ratio, expressed as a percentage, of the weight of the water in a given mass of soil to the weight of the solid particles. These tests were conducted in accordance with ASTM Designation D 2216-66. The test results are presented on the attached sheets.

Soil Plasticity Test (Atterberg Limits Test): A representative sample of the onsite soils was selected for Atterberg Limits testing to determine the soil's plasticity characteristics. The Plasticity Index (PI) is representative of this characteristic and is bracketed by the Liquid Limit (LL) and the Plastic Limit (PL). The Liquid Limit is the moisture content at which the soil will flow as a heavy viscous fluid and is determined in accordance with ASTM D 423. The Plastic Limit is the moisture content at which the soil begins to lose its plasticity and is determined in accordance with ASTM D 424. The data obtained is presented on the attached sheets.

Compaction Test: A representative sample of the onsite soils was obtained from the soil test borings to determine their suitability as fill material. A Standard Proctor Compaction Test (ASTM D 698) was performed on these soils to determine its compaction characteristics, including maximum dry density and optimum moisture content. The test results are presented on the attached sheets.

California Bearing Ratio (CBR): The results of the compaction test described above were utilized in compacting samples for laboratory CBR tests. The California Bearing Ratio is a punching shear test which provides a semi-empirical index of the strength and deflection characteristics of a soil which has been correlated with pavement performance. The test is performed on a six (6) inch diameter, 4.61 inch thick disc of compacted soil that is confined in a steel cylinder. Before testing, the sample is inundated under a confining pressure approximately equal to the weight of the future pavement in order to determine the potential swelling, and to simulate the worst case conditions that can occur in the field. A piston approximately two (2) inches in diameter is then forced into the soil at a standard rate to determine the resistance to penetration. The CBR value is the ratio expressed as a percentage of the actual load required to produce a 0.1 inch deflection to that required to produce the same deflection in a standardized crushed stone. The results of the CBR tests are shown on the attached sheets.

BORING NO.: B-1
DATE DRILLED: 11/13/09
DRILLING CONTRACTOR: Soil Drilling Services
JOB NO.: CH09.0088.GE
PROJECT: BUILDING 42 ADDITIONS & RENOVATIONS

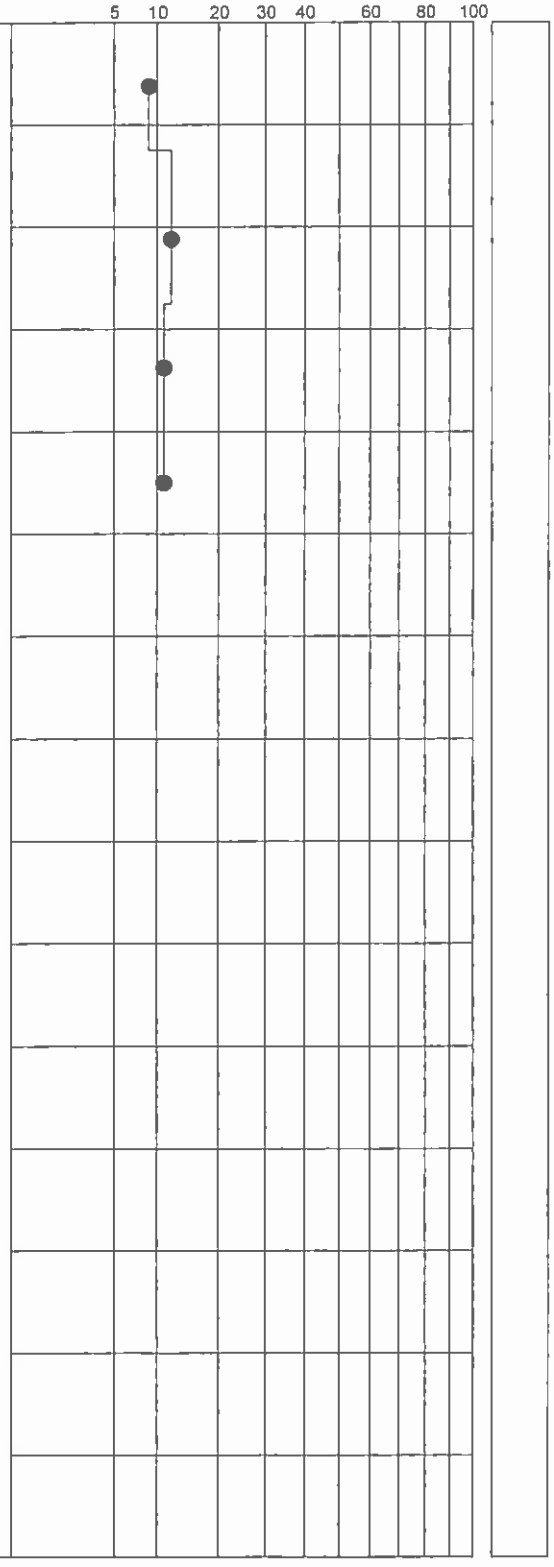
TEST BORING RECORD

GEOSCIENCE GROUP INC.

DEPTH, FT.	DESCRIPTION	Elev. 689.0±	Blow Count
0.0			
0.5	Topsoil And Roots	688.5	
	Stiff Reddish-Brown And Brown Slightly Micaceous Coarse To Fine Sandy Clayey SILT With Fine Roots - Residual		9
2.5	Note: Sample Moist	686.5	
	Stiff Reddish-Brown And Tan Clayey Medium To Fine Sandy SILT		12
5.5		683.5	
	Stiff Reddish-Brown, Brown, Tan And Black Slightly Micaceous Clayey Medium To Fine Sandy SILT		11
8.0		681.0	
	Stiff Brown And Tan Slightly Micaceous Clayey Medium To Fine Very Sandy SILT		11
10.0		679.0	
	Boring Terminated No Groundwater Encountered		

● PENETRATION - BLOW COUNT*

5 10 20 30 40 60 80 100



BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

*PENETRATION IS THE NUMBER OF BLOWS OF A 140 LB. (63.5kg) HAMMER FALLING 30 IN. (76.2cm) REQUIRED TO DRIVE A 1.4 IN. (3.6cm) I.D. SAMPLER 1 FT. (30.5cm)

PRESSUREMETER TEST
|50|% ROCK CORE RECOVERY
◄ LOSS OF DRILLING WATER
WOH WEIGHT OF HAMMER
WATER TABLE - 24 HR.
WATER TABLE - 1 HR.
CAVE-IN DEPTH

BORING NO.: B-2
DATE DRILLED: 11/13/09
DRILLING CONTRACTOR: Soil Drilling Services
JOB NO.: CH09.0088.GE
PROJECT: BUILDING 42 ADDITIONS & RENOVATIONS

TEST BORING RECORD

GEOSCIENCE GROUP INC.

DEPTH, FT.	DESCRIPTION	Elev. 689.0±	Blow Count
0.0			
0.2	Topsoil And Roots	688.8	
	Firm Reddish-Brown And Brown Slightly Micaceous Medium To Fine Sandy Very Silty CLAY With Trace Organics And Rock Fragments - Fill		8
2.5		686.5	
	Firm Reddish-Brown And Brown Slightly Micaceous Coarse To Fine Sandy Clayey SILT With Trace Organics - Fill		7
5.5		683.5	
	Very Stiff Brown, Tan And Black Clayey Coarse To Fine Sandy SILT With Quartz Fragments - Residual		22
8.0		681.0	
	Stiff Brown, Tan And Black Clayey Coarse To Fine Sandy SILT With Clay Seams And Quartz Fragments		15
10.0	Note: Sample Moist	679.0	
	Boring Terminated No Groundwater Encountered		
	Note: Bulk Sample Of Auger Cuttings Obtained From 0 To 5 Feet		

● PENETRATION - BLOW COUNT*

5 10 20 30 40 60 80 100

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

*PENETRATION IS THE NUMBER OF BLOWS OF A 140 LB. (63.5kg) HAMMER FALLING 30 IN. (76.2cm) REQUIRED TO DRIVE A 1.4 IN. (3.6cm) I.D. SAMPLER 1 FT. (30.5cm)

PRESSUREMETER TEST
50/% ROCK CORE RECOVERY
◄ LOSS OF DRILLING WATER
WOH WEIGHT OF HAMMER
WATER TABLE - 24 HR.
WATER TABLE - 1 HR.
CAVE-IN DEPTH

BORING NO.: B-3
DATE DRILLED: 11/13/09
DRILLING CONTRACTOR: Soil Drilling Services
JOB NO.: CH09.0088.GE
PROJECT: BUILDING 42 ADDITIONS & RENOVATIONS

TEST BORING RECORD

GEOSCIENCE GROUP INC.

DEPTH, FT.	DESCRIPTION	Elev. 695.0±	Blow Count
0.0			
0.3	Topsoil And Roots	694.7	
	Very Firm Tan And Grey Silty Coarse To Fine SAND With Rock Fragments - Fill		27
	Note: Blow Count Influenced By Rock Fragments		
2.5		692.5	
	Stiff Reddish-Brown And Brown Coarse To Fine Sandy Very Clayey SILT With Rock Fragments - Fill		12
			13
8.0		687.0	
	Stiff Brown And Grey Fine Sandy Silty CLAY (Highly Plastic) - Residual		11
12.0		683.0	
	Stiff Brown And Grey Coarse To Fine Sandy Clayey SILT		13
17.0		678.0	
	Partially Weathered Rock When Sampled Becomes Tan, Grey And White Silty Coarse To Fine SAND		50/0.5
20.0		675.0	
	Boring Terminated No Groundwater Encountered		

● PENETRATION - BLOW COUNT*

5 10 20 30 40 60 80 100

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

*PENETRATION IS THE NUMBER OF BLOWS OF A 140 LB. (63.5kg) HAMMER FALLING 30 IN. (76.2cm) REQUIRED TO DRIVE A 1.4 IN. (3.6cm) I.D. SAMPLER 1 FT. (30.5cm)

PRESSUREMETER TEST
|50|% ROCK CORE RECOVERY
◄ LOSS OF DRILLING WATER
WOH WEIGHT OF HAMMER
WATER TABLE - 24 HR.
WATER TABLE - 1 HR.
CAVE-IN DEPTH

BORING NO.: B-4
DATE DRILLED: 11/13/09
DRILLING CONTRACTOR: Soil Drilling Services
JOB NO.: CH09.0088.GE
PROJECT: BUILDING 42 ADDITIONS & RENOVATIONS

TEST BORING RECORD

GEOSCIENCE GROUP INC.

DEPTH, FT.	DESCRIPTION	Elev. 688.0±	Blow Count
0.0			
0.3	Topsoil And Roots	687.7	
	Firm Reddish-Brown And Brown Slightly Micaceous Medium To Fine Sandy Very Clayey SILT With Rock Fragments - Fill		8
2.5		685.5	
	Stiff Reddish-Brown, Brown And Black Coarse To Fine Sandy Clayey SILT With Manganese Nodules - Residual		14
5.5		682.5	
	Very Stiff Reddish-Brown, Brown And Tan Clayey Medium To Fine Sandy SILT		16
8.0		680.0	
	Very Stiff Reddish-Brown And Brown Medium To Fine Sandy Clayey SILT		18
12.0		676.0	
	Firm Brown And Grey Slightly Micaceous Fine Sandy SILT		8
15.0		673.0	
	Boring Terminated No Groundwater Encountered		

● PENETRATION - BLOW COUNT*

5 10 20 30 40 60 80 100

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

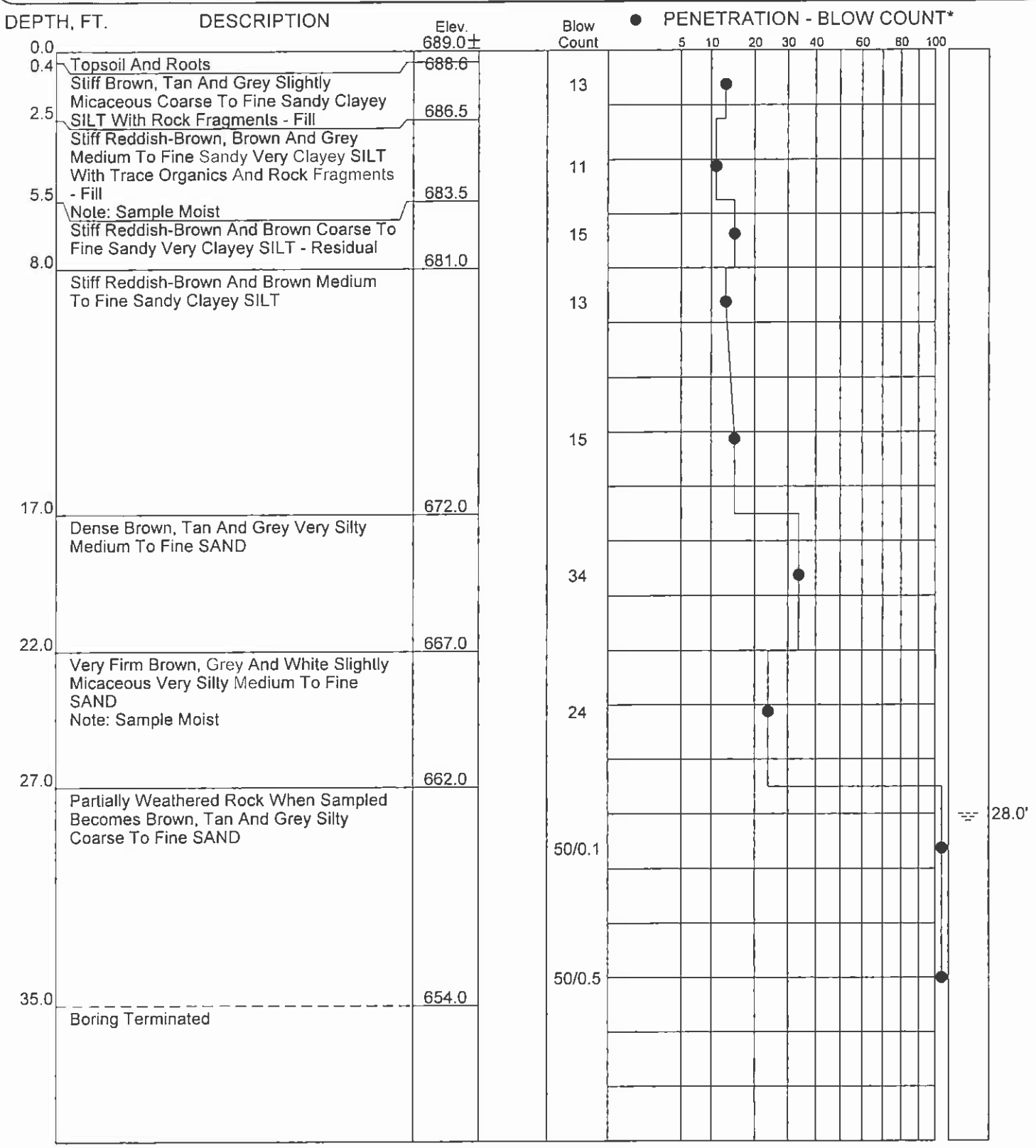
*PENETRATION IS THE NUMBER OF BLOWS OF A 140 LB. (63.5kg) HAMMER FALLING 30 IN. (76.2cm) REQUIRED TO DRIVE A 1.4 IN. (3.6cm) I.D. SAMPLER 1 FT. (30.5cm)

PRESSUREMETER TEST
50/% ROCK CORE RECOVERY
◄ LOSS OF DRILLING WATER
WOH WEIGHT OF HAMMER
WATER TABLE - 24 HR.
WATER TABLE - 1 HR.
CAVE-IN DEPTH

BORING NO.: B-5
DATE DRILLED: 11/13/09
DRILLING CONTRACTOR: Soil Drilling Services
JOB NO.: CH09.0088.GE
PROJECT: BUILDING 42 ADDITIONS & RENOVATIONS

TEST BORING RECORD

GEOSCIENCE GROUP INC.



BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

*PENETRATION IS THE NUMBER OF BLOWS OF A 140 LB. (63.5kg) HAMMER FALLING 30 IN. (76.2cm) REQUIRED TO DRIVE A 1.4 IN. (3.6cm) I.D. SAMPLER 1 FT. (30.5cm)

PRESSUREMETER TEST
50/% ROCK CORE RECOVERY
◄ LOSS OF DRILLING WATER
WOH WEIGHT OF HAMMER
WATER TABLE - 24 HR.
WATER TABLE - 1 HR.
CAVE-IN DEPTH

BORING NO.: B-6
DATE DRILLED: 11/13/09
DRILLING CONTRACTOR: Soil Drilling Services
JOB NO.: CH09.0088.GE
PROJECT: BUILDING 42 ADDITIONS & RENOVATIONS

TEST BORING RECORD

GEOSCIENCE GROUP INC.

DEPTH, FT.	DESCRIPTION	Elev 687.0±	Blow Count
0.0			
0.3	Topsoil And Roots	686.7	
	Firm Reddish-Brown And Brown Slightly Micaceous Medium To Fine Sandy Very Clayey SILT With Trace Organics - Fill		7
2.5	Note: Sample Moist	684.5	
	Stiff Reddish-Brown And Brown Slightly Micaceous Medium To Fine Sandy Clayey SILT With Trace Organics - Fill		12
5.5		681.5	
	Stiff Reddish-Brown, Brown And Black Coarse To Fine Sandy Very Clayey SILT With Manganese Nodules - Residual		12
8.0		679.0	
	Stiff Reddish-Brown, Brown And Tan Medium To Fine Sandy Clayey SILT		11
12.0		675.0	
	Loose Brown And Tan Slightly Micaceous Very Silty Medium To Fine SAND		8
	Note: Sample Moist		
15.0		672.0	
	Boring Terminated		
	No Groundwater Encountered		

● PENETRATION - BLOW COUNT*

5 10 20 30 40 60 80 100

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

*PENETRATION IS THE NUMBER OF BLOWS OF A 140 LB. (63.5kg) HAMMER FALLING 30 IN. (76.2cm) REQUIRED TO DRIVE A 1.4 IN. (3.6cm) I.D. SAMPLER 1 FT. (30.5cm)

PRESSUREMETER TEST
|50|% ROCK CORE RECOVERY
◄ LOSS OF DRILLING WATER
WOH WEIGHT OF HAMMER
WATER TABLE - 24 HR.
WATER TABLE - 1 HR.
CAVE-IN DEPTH

BORING NO.: B-7
DATE DRILLED: 11/13/09
DRILLING CONTRACTOR: Soil Drilling Services
JOB NO.: CH09.0088.GE
PROJECT: BUILDING 42 ADDITIONS & RENOVATIONS

TEST BORING RECORD

GEOSCIENCE GROUP INC.

DEPTH, FT.	DESCRIPTION	Elev. 687.0±	Blow Count
0.0			
0.3	Topsoil And Roots	686.7	
	Soft Reddish-Brown And Tan Slightly Micaceous Medium To Fine Sandy Very Clayey SILT With Fine Roots - Residual Note: Sample Very Moist		3
3.0		684.0	
	Firm Brown, Tan And Grey Medium To Fine Sandy Silty CLAY With Fine Roots (Highly Plastic) Note: Sample Moist		7
5.5		681.5	
	Stiff Brown And Grey Slightly Micaceous Clayey Fine Sandy SILT Note: Sample Very Moist		11
8.0		679.0	
	Stiff Brown, Tan And Grey Clayey Medium To Fine Sandy SILT Note: Sample Moist		11
12.0		675.0	
	Very Firm Brown, Tan And Grey Slightly Micaceous Very Silty Medium To Fine SAND Note: Sample Moist		21
15.0		672.0	
	Boring Terminated No Groundwater Encountered		

● PENETRATION - BLOW COUNT*

5 10 20 30 40 60 80 100

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

*PENETRATION IS THE NUMBER OF BLOWS OF A 140 LB. (63.5kg) HAMMER FALLING 30 IN. (76.2cm) REQUIRED TO DRIVE A 1.4 IN. (3.6cm) I.D. SAMPLER 1 FT. (30.5cm)

PRESSUREMETER TEST
50/% ROCK CORE RECOVERY
◄ LOSS OF DRILLING WATER
WOH WEIGHT OF HAMMER
WATER TABLE - 24 HR.
WATER TABLE - 1 HR.
CAVE-IN DEPTH

BORING NO.: B-8
DATE DRILLED: 11/13/09
DRILLING CONTRACTOR: Soil Drilling Services
JOB NO.: CH09.0088.GE
PROJECT: BUILDING 42 ADDITIONS & RENOVATIONS

TEST BORING RECORD

GEOSCIENCE GROUP INC.

DEPTH, FT.	DESCRIPTION	Elev. 688.0±	Blow Count
0.0			
0.5	Topsoil And Roots	687.5	
	Firm Reddish-Brown, Brown And Grey Slightly Micaceous Medium To Fine Sandy Very Clayey SILT With Trace Organics - Fill		5
2.5	Note: Sample Moist	685.5	
	Firm Brown And Tan Clayey Coarse To Fine Sandy SILT With Fine Roots - Residual		7
5.5		682.5	
	Firm Brown, Tan And Grey Slightly Micaceous Very Silty Medium To Fine SAND With Clay Seams		17
8.0		680.0	
	Very Firm To Dense Brown And Grey Slightly Micaceous Very Silty Medium To Fine SAND		29
			48
15.0		673.0	
	Boring Terminated No Groundwater Encountered		

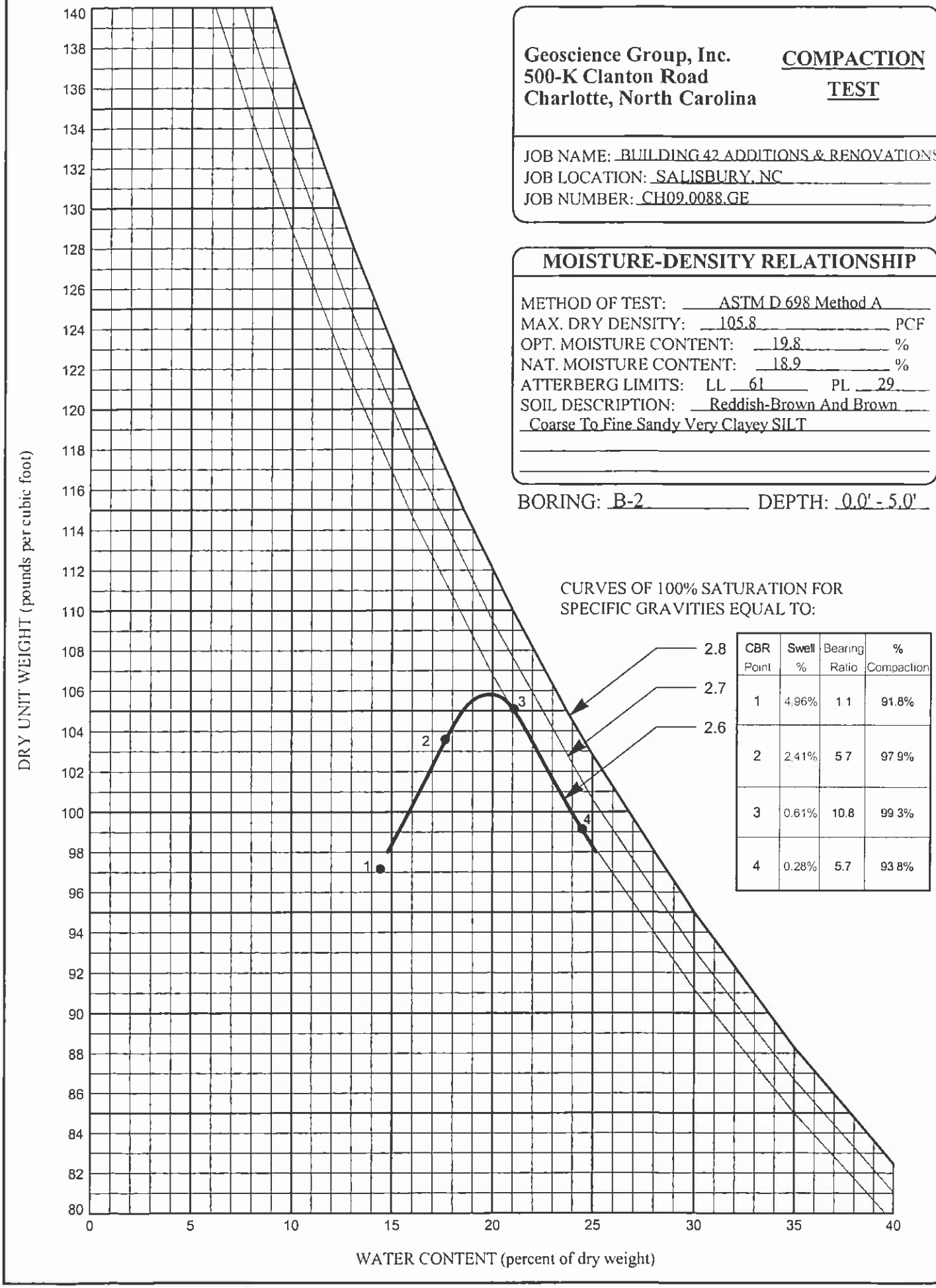
● PENETRATION - BLOW COUNT*

5 10 20 30 40 60 80 100

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

*PENETRATION IS THE NUMBER OF BLOWS OF A 140 LB. (63.5kg) HAMMER FALLING 30 IN. (76.2cm) REQUIRED TO DRIVE A 1.4 IN. (3.6cm) I.D. SAMPLER 1 FT. (30.5cm)

PRESSUREMETER TEST
|50|% ROCK CORE RECOVERY
◄ LOSS OF DRILLING WATER
WOH WEIGHT OF HAMMER
WATER TABLE - 24 HR.
WATER TABLE - 1 HR.
CAVE-IN DEPTH



CBR Point	Swell %	Bearing Ratio	% Compaction
1	4.96%	1.1	91.8%
2	2.41%	5.7	97.9%
3	0.61%	10.8	99.3%
4	0.28%	5.7	93.8%

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Charlotte, North Carolina

COMPACTION TEST

JOB NAME: BUILDING 42 ADDITIONS & RENOVATIONS
JOB LOCATION: SALISBURY, NC
JOB NUMBER: CH09.0088.GE

MOISTURE-DENSITY RELATIONSHIP

METHOD OF TEST: ASTM D 698 Method A
MAX. DRY DENSITY: 105.8 PCF
OPT. MOISTURE CONTENT: 19.8 %
NAT. MOISTURE CONTENT: 18.9 %
ATTERBERG LIMITS: LL 61 PL 29
SOIL DESCRIPTION: Reddish-Brown And Brown Coarse To Fine Sandy Very Clayey SILT

BORING: B-2 DEPTH: 0.0' - 5.0'

CALIFORNIA BEARING RATIO TEST

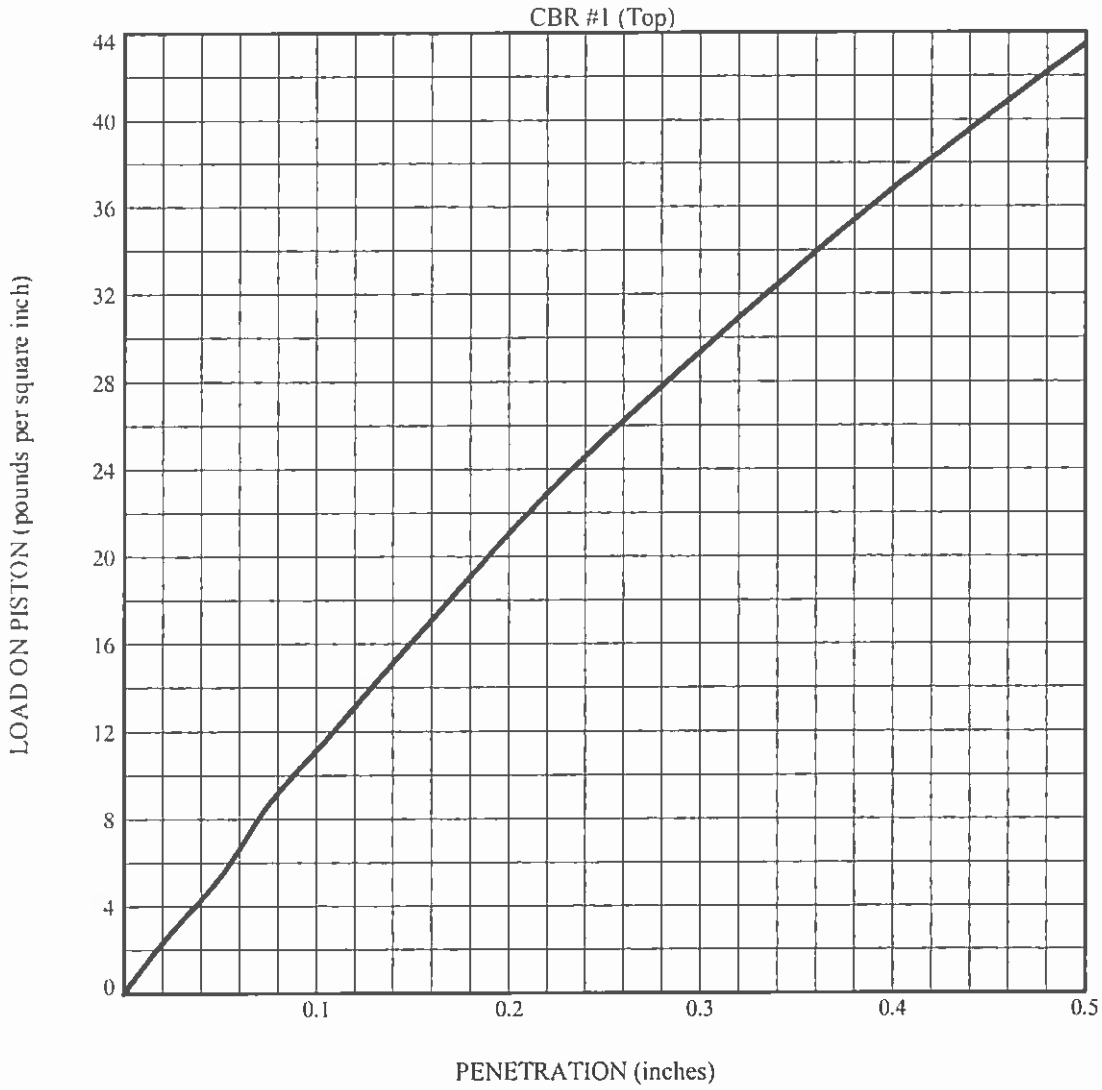
JOB NAME: BUILDING 42 ADDITIONS & RENOVATIONS

JOB NUMBER: CH09.0088.GE

JOB LOCATION: SALISBURY, NC

BORING NUMBER: B-2

BORING DEPTH: 0.0' - 5.0'



1. Method of Preparation: ASTM D 698 Method C
2. Description of Sample: Reddish-Brown And Brown Coarse To Fine Sandy Very Clayey SILT
3. Dry Density Before Soaking: 97.1 PCF
4. Swell: 4.96%
5. Percent of Optimum Standard Compaction: 91.8%
6. Moisture Content: 14.4%
7. Bearing Ratio @ 0.1 Inch: 1.1
8. Surcharge: 72.6 PSF

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CALIFORNIA BEARING RATIO TEST

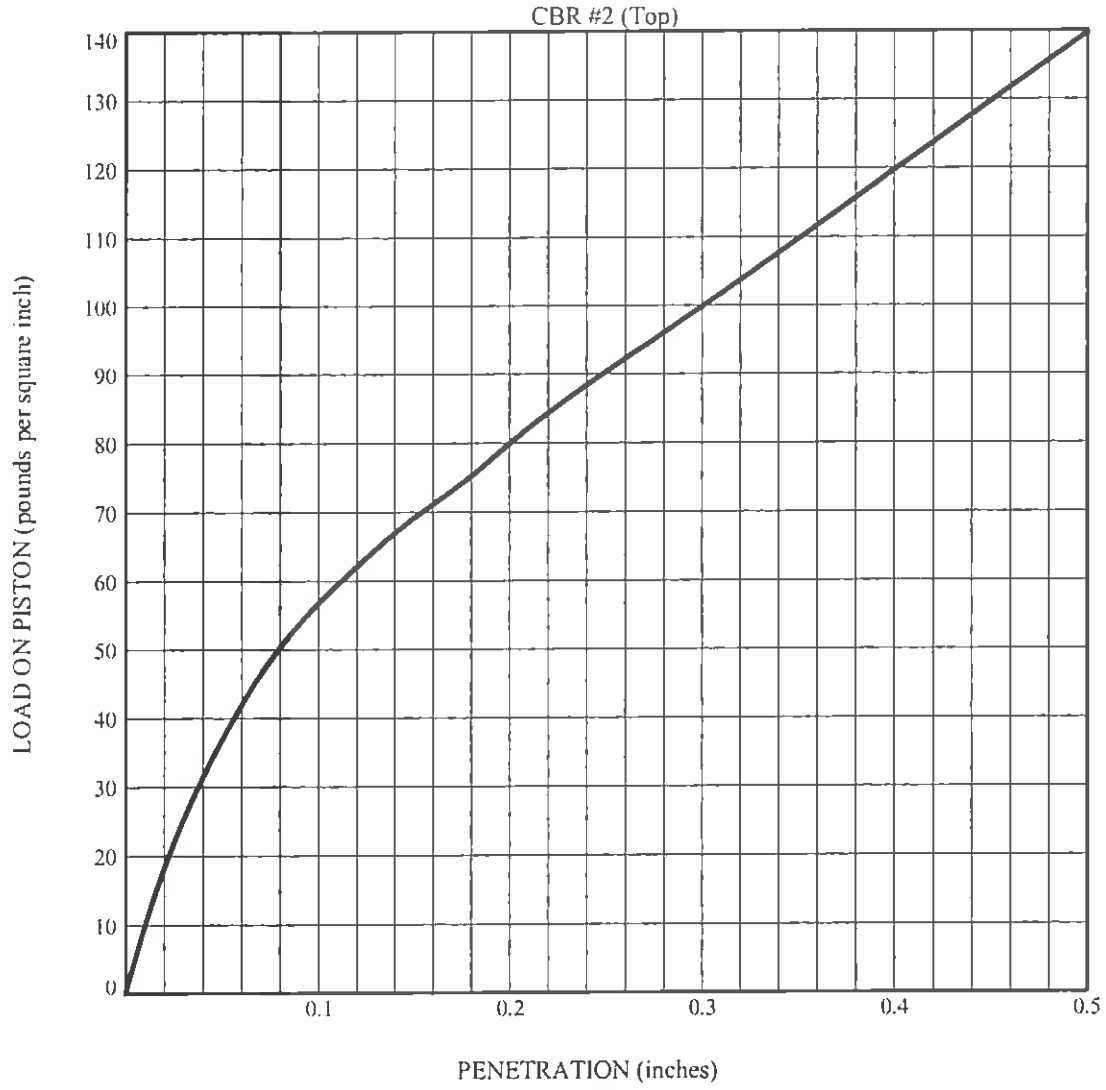
JOB NAME: BUILDING 42 ADDITIONS & RENOVATIONS

JOB NUMBER: CH09.0088.GE

JOB LOCATION: SALISBURY, NC

BORING NUMBER: B-2

BORING DEPTH: 0.0' - 5.0'



1. Method of Preparation: ASTM D 698 Method C
2. Description of Sample: Reddish-Brown And Brown Coarse To Fine Sandy Very Clayey SILT
3. Dry Density Before Soaking: 103.6 PCF
4. Swell: 2.41%
5. Percent of Optimum Standard Compaction: 97.9%
6. Moisture Content: 17.7%
7. Bearing Ratio @ 0.1 Inch: 5.7
8. Surcharge: 72.6 PSF

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CALIFORNIA BEARING RATIO TEST

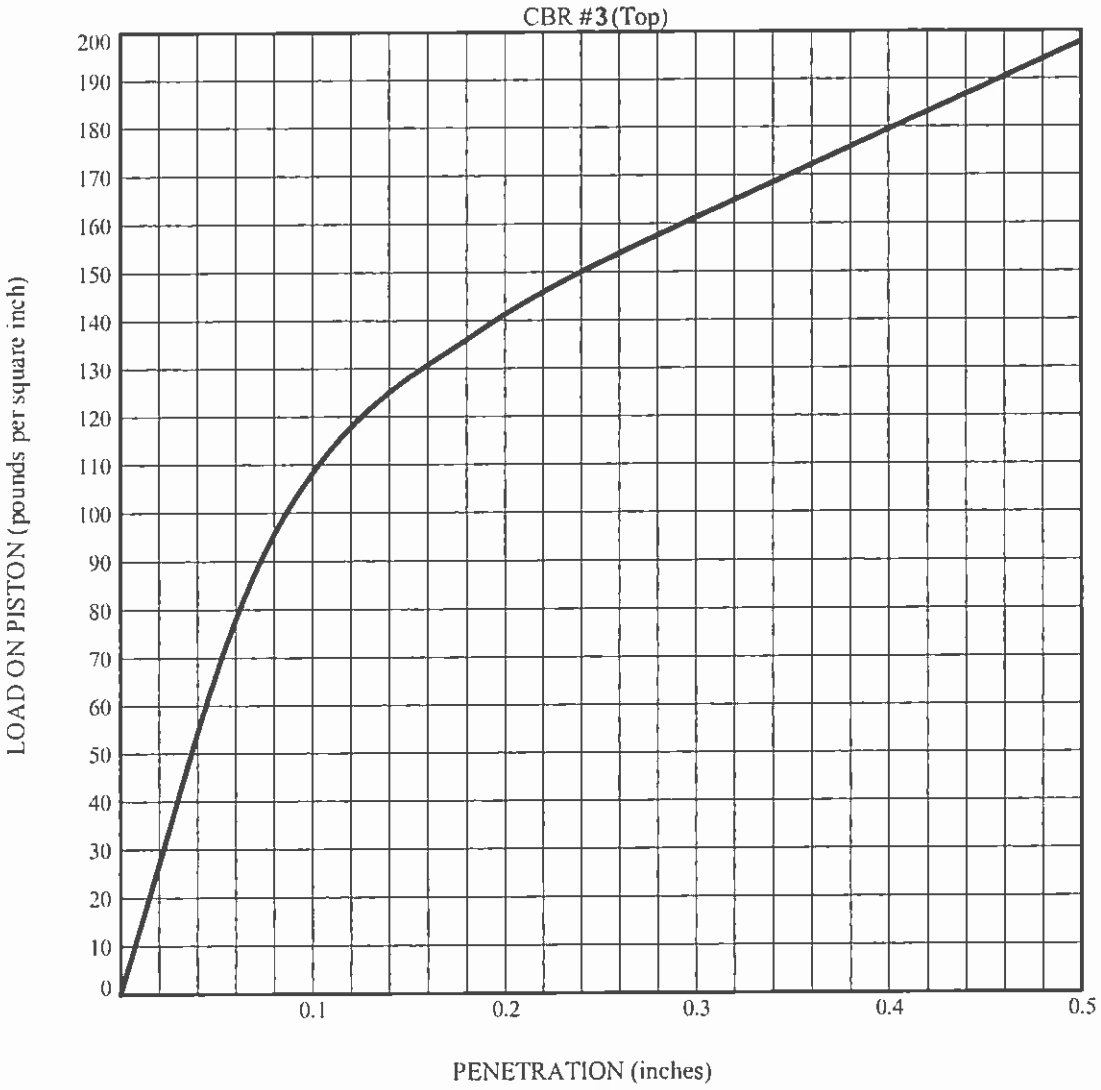
JOB NAME: BUILDING 42 ADDITIONS & RENOVATIONS

JOB NUMBER: CH09.0088.GE

JOB LOCATION: SALISBURY, NC

BORING NUMBER: B-2

BORING DEPTH: 0.0' - 5.0'



1. Method of Preparation: ASTM D 698 Method C
2. Description of Sample: Reddish-Brown And Brown Coarse To Fine Sandy Very Clayey SILT
3. Dry Density Before Soaking: 105.1 PCF
4. Swell: 0.61%
5. Percent of Optimum Standard Compaction: 99.3%
6. Moisture Content: 21.1%
7. Bearing Ratio @ 0.1 Inch: 10.8
8. Surcharge: 72.6 PSF

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CALIFORNIA BEARING RATIO TEST

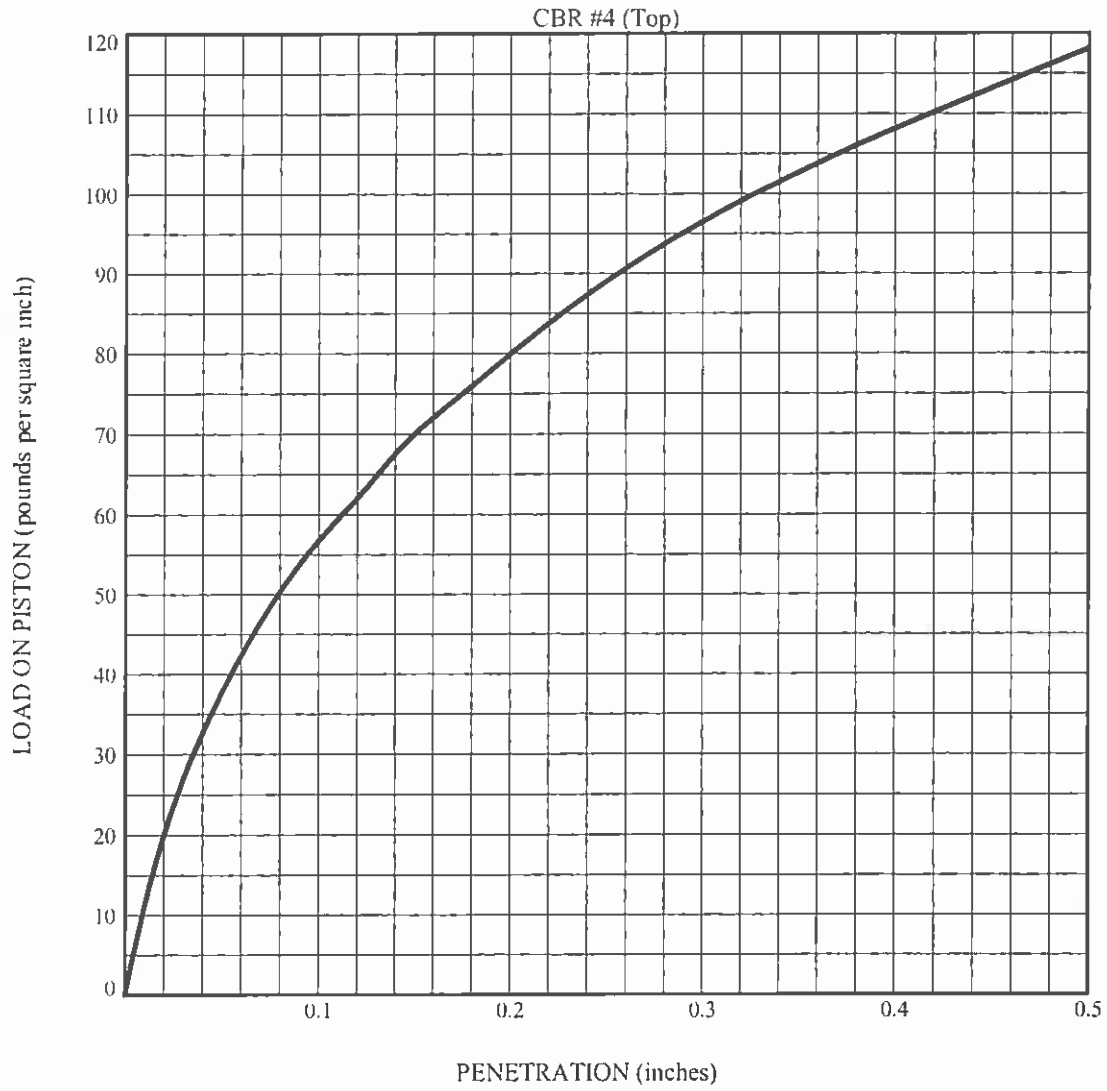
JOB NAME: BUILDING 42 ADDITIONS & RENOVATIONS

JOB NUMBER: CH09.0088.GE

JOB LOCATION: SALISBURY, NC

BORING NUMBER: B-2

BORING DEPTH: 0.0' - 5.0'



1. Method of Preparation: ASTM D 698 Method C
2. Description of Sample: Reddish-Brown And Brown Coarse To Fine Sandy Very Clayey SILT
3. Dry Density Before Soaking: 99.2 PCF
4. Swell: 0.28%
5. Percent of Optimum Standard Compaction: 93.8%
6. Moisture Content: 24.5%
7. Bearing Ratio @ 0.1 Inch: 5.7
8. Surcharge: 72.6 PSF

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